

# Thoracoabdominal Incisions and Resection of Upper Retroperitoneal Sarcomas

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**Background and Objectives:** There is a widespread impression among surgeons that a thoracoabdominal incision carries a substantially higher risk of morbidity and possible mortality over abdominal incisions. We decided therefore to critically review our experience of the last 4 years with these incisions.

**Methods:** This is a retrospective review of all cases of retroperitoneal sarcomas of upper abdominal quadrants in the period May 1995 through February 1999. There were 33 consecutive patients and 34 thoracoabdominal incisions (1 patient had a second operation for recurrence). Their mean age was 54 years, with 13 >60 and 7 >70 years.

**Results:** Eighteen patients were extubated immediately at the end of the procedure and the rest within 24 h. In the majority of instances (32 of 34 or 94%), the patients left the intensive care unit within 48 h. The most common postoperative complication was atelectasis (7 of 34, 21%). There was no postoperative death. The retroperitoneal tumor was resected in all 34 cases (100%).

**Conclusions:** The thoracoabdominal incision for upper quadrant retroperitoneal sarcomas is tolerated well by the patients with a morbidity similar to that observed after routine abdominal incisions. It allows complete resection of the tumor in most (all in this series) cases.

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**KEY WORDS:** thoracoabdominal incisions; retroperitoneal sarcomas

## INTRODUCTION

The majority of patients with retroperitoneal sarcomas are explored through a midline incision extending from the xiphoid to the pubic symphysis. This incision is simple to make and close and certainly provides good exposure in many instances. However, it is not ideal for retroperitoneal sarcomas of the upper abdominal quadrants. For such tumors, at least when they are large, the best surgical approach is a thoracoabdominal incision on the ipsilateral side. However, thoracoabdominal incisions have been avoided by surgeons on the belief that they are associated with high morbidity and possible mortality. In the following, our experience with thoracoabdominal incision in retroperitoneal sarcomas over the period of about 4 years has been reviewed.

## MATERIALS AND METHODS

This is a retrospective review of 34 operations for upper abdominal quadrant sarcomas in the period from May 1995 to February 1998. There were 33 patients, with 1 patient having 2 resections. Of these, 24 were men and 9 women. Their mean age was 54 years (range 16–80). Thirteen patients were >60 years and 7 were >70 years.

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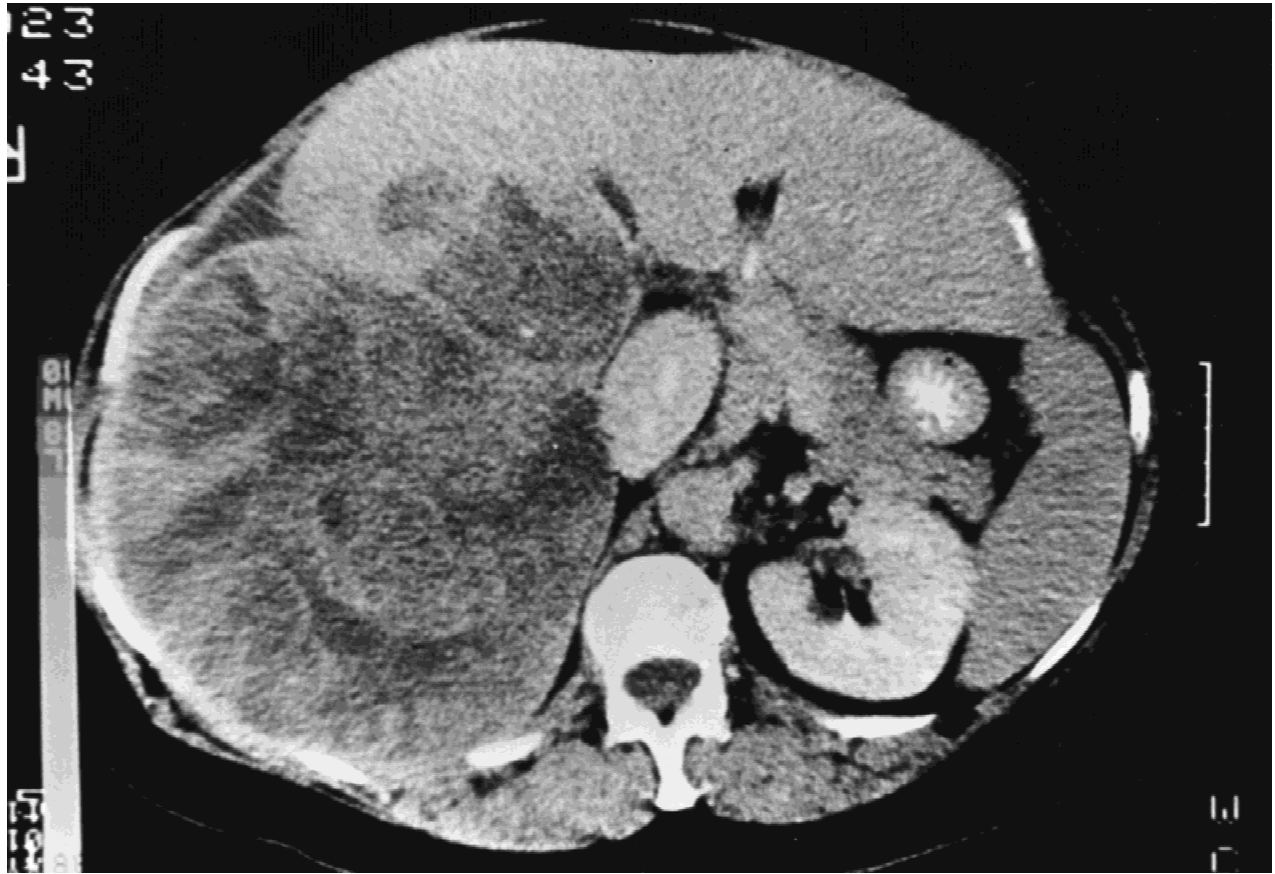


Fig. 1. Right upper quadrant sarcoma involving the right lobe of the liver. The right kidney is displaced medially.

The histologic types were liposarcomas in 18, leiomyosarcomas in 12, and other subtypes in 4. In 10 of the operations, the sarcoma was a primary tumor, and in 24 it was locally recurrent. A right thoracoabdominal incision was used in 12 patients (Figs. 1, 2) and a left thoracoabdominal incision in 22 (Figs. 3–5). In 11 of the 34 cases, the tumor was considered unresectable upon evaluation elsewhere. It was possible to resect the tumor in all 34 cases (100%). In all the patients, the inner layer of the anterolateral abdominal wall muscles or quadratus lumborum posteriorly were resected en bloc, as needed. The structures resected en bloc with the tumor are depicted in Table I.

### Operative Technique

The patient was placed in a lateral position with the affected side up, and an incision was made from the coastal margin to the midline starting at the level of the 9th intercostal space. The peritoneal cavity was entered, and exploration was performed to rule out distant metastasis or disseminated disease. The incision was then extended, usually into the 9th intercostal space, although in some patients the 10th or 11th space was used. Postero-

lateral dissection and mobilization of the tumor were then performed removing, if needed, portions of or the entire hemidiaphragm. It is important to first mobilize the tumor posterolaterally and then proceed to identify the structures that need to be dissected off or resected en bloc with the tumor. These are the hepatic or splenic flexure of the colon, the ipsilateral kidney, a portion of or the entire right lobe of the liver on the right side (Fig. 2), and the distal pancreas and spleen and/or portion of the stomach on the left side (Fig. 5). After the tumor is mobilized posterolaterally and freed up as much as possible superiorly and inferiorly, then one can address the structures toward the midline. With prior mobilization of the tumor, one has much greater control as the dissection proceeds between the tumor and inferior vena cava on the right side or the aorta on the left side.

Due to the size of the tumors, the thoracoabdominal incision was combined (in the form of T) with a midline abdominal incision extending cephalad toward the xiphoid and caudad toward the pubic symphysis, as required by the demands for exposure. A combined retroperitoneal and transperitoneal dissection is thus performed.



Fig. 2. Operative field after removal of tumor shown in Figure 1, showing the right lung base, inferior vena cava, the stumps of right renal vessels, and the remaining left lobe of the liver.

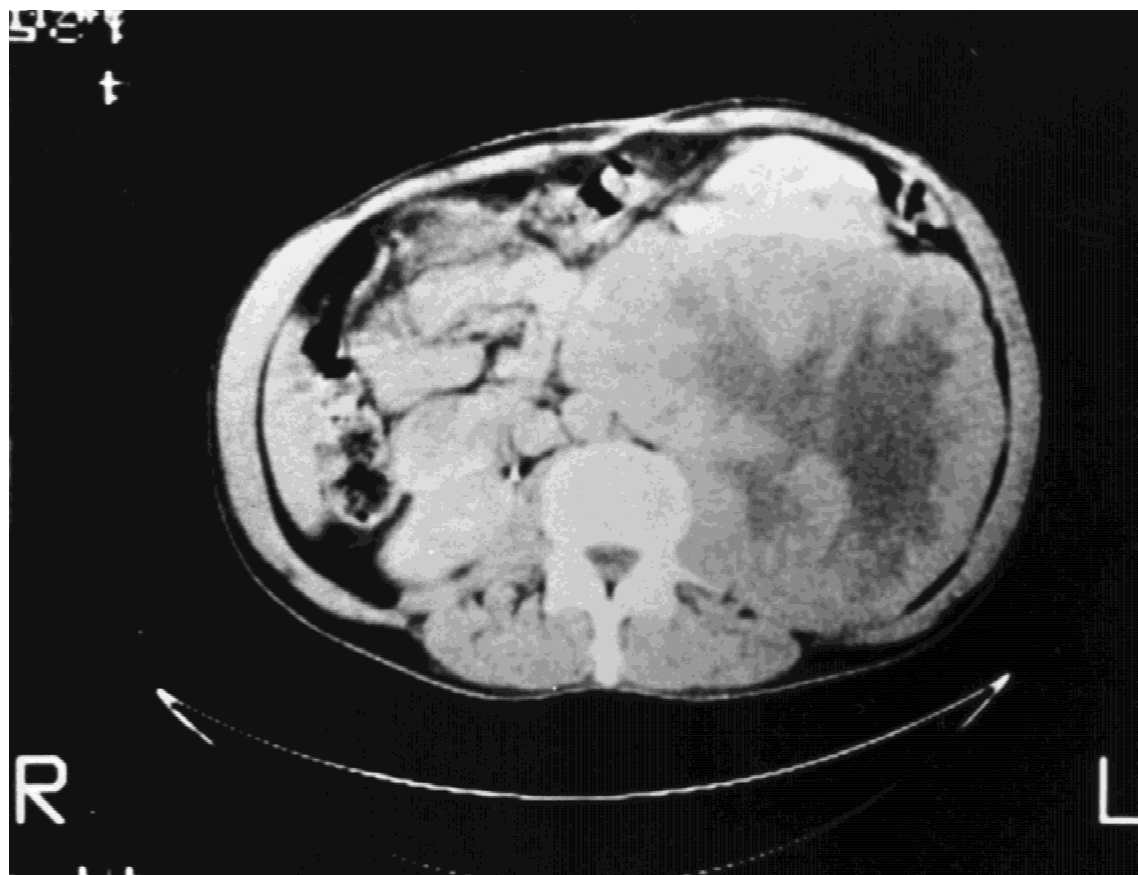


Fig. 3. Left upper quadrant sarcoma showing anterior displacement of the left kidney. The tumor was removed through a left thoracoabdominal incision combined with a midline incision.



Fig. 4. Left upper quadrant sarcoma.

## RESULTS

There was no postoperative mortality within the first 3 months following surgery. The morbidity encountered is depicted in Table II. The average blood loss for these 34 procedures was 948 ml per case (50–3,300 ml). The mean duration of the operation was 6.9 h (1.25–13.5 h).

Eighteen patients could be extubated immediately postoperatively, while 16 were extubated within 24 h. The stay in the intensive care unit after surgery was 0–24 h in 16 patients, 24–48 h in 16 patients, 48–72 h in 1 patient, and 5 days in 1 patient. The mean hospital stay was 8.3 days (4–17 days).

## DISCUSSION

Retroperitoneal sarcomas have been notoriously difficult tumors that often do not permit a complete resection. In a collective review reporting on 560 cases of retroperitoneal sarcoma published in various series, the complete resection rate was 53% and the 5-year survival rate 34% [1]. The rate of resectability in various series has ranged from 38% [2,3] to 74% [4], with the results of other reports falling in between [5–9]. In a previous review of our patients with primary or locally recurrent retroperitoneal sarcomas treated in the period of 1977–

1995, the complete resectability rate was 96%, and the 5-year survival rate 63% (66% for primary tumors and 57% for those with local recurrence) [10].

In a collective review paper [1], Storm and Mahvi recommended, as the best incision for these tumors, a midline abdominal incision with the patient supine and initial dissection between the tumor and the aorta on the left side and the inferior vena cava on the right side to determine separability of the tumor from these major vascular structures, and therefore its resectability. In our experience with retroperitoneal sarcomas, at least those in the upper quadrants of the abdomen and flank, the patient is best placed in a lateral position and then a flank or thoracoabdominal incision is used, which is combined with a midline incision in the form of a T to provide adequate exposure. The tumor is dissected posterolaterally, mobilized, and then freed from any adjacent structures, or the involved parts of adjacent structures (after dissection around them) are left on the tumor surface. Then as the last step, the dissection between the tumor and the aorta on the left side or the inferior vena cava on the right side is performed. In this fashion, the tumor is first mobilized off its bed and retracted out of the wound, and the potential space between the tumor and the aorta





Fig. 5. Operative field after resection of tumor shown in Figure 4, showing the base of the left lung. The diaphragm, spleen, distal pancreas, and left kidney have been removed.

**TABLE I. Structures Resected En Bloc with the Tumor (34 Procedures)**

Structure	No.	%
Portion of liver	3	9
Kidney	11	32
Diaphragm	10	29
Distal pancreas	10	29
Portion of stomach	7	21
Spleen	11	32
Ureter only	1	3
Bowel	10	29

or inferior vena cava, which is often in the range of 1–2 mm, can be widened and vascular control on the aorta and inferior vena cava made easier once the tumor has been mobilized completely. Any branches from the aorta or tributaries to the inferior vena cava can thus be controlled more easily.

In the upper quadrants of the abdomen, the thoracoabdominal incision is the incision par excellence. There is a widespread impression, however, that a thoracoabdominal incision is associated with excessive morbidity and possible mortality. Our experience in the present article with 34 thoracoabdominal incisions for primary or

**TABLE II. Morbidity after 34 Thoracoabdominal Incisions**

Complications	No.	%
Atelectasis	7	21
Prolonged ileus	3	9
Fever	3	9
Wound infection	1	3
Partial small bowel obstruction	2	6
Fecal fistula (closed spontaneously)	1	3

locally recurrent sarcomas of the upper abdominal quadrants suggests that this incision provides the opportunity for complete resection of the tumor in all or nearly all the cases, and that the operative mortality (none in this series) and postoperative morbidity are not different from those encountered after major tumor resections through customary abdominal incisions.

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